AMENDMENTS TO THE CLAIMS

This listing of the claims replaces all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

1. [Currently Amended] A method of transmitting information in an unsynchronized Orthogonal Frequency Division Multiplexing (OFDM) communication network comprising a plurality of base stations, the method comprising:

modulating access channel information onto ~~at least one set of time continuous signal components of a communication signal, each set of time continuous signal components having a respective common frequency, the communication signal comprising a plurality of signal components~~ a predetermined initial access channel of an OFDM communications signal, wherein the access channel information comprises a common synchronization code that is common to each of the plurality of base stations and a cell-specific synchronization code that is orthogonal to the common synchronization code and unique to each base station, and wherein the initial access channel comprises a predetermined set of one or more time-continuous signal components of the OFDM communications signal, each time-continuous signal component being carried by a respective sub-carrier; and

transmitting the communication signal.

2. [Cancelled]

3. [Currently Amended] The method of claim ~~2~~1, wherein the common synchronization code comprises a complex PN (pseudo noise) sequence ~~associated with a plurality of transceiver stations in a communication network and~~ known to communication terminals configured for accessing the communication network.

4. [Cancelled]

5. [Cancelled]

6. [Currently Amended] The method of claim 1, wherein the communication signal further comprises a scattered pilot channel, and wherein ~~modulating comprises modulating a first portion of the access channel information to the at least one set of time-continuous signal components and modulating a second portion of the access channel information to both the at least one set of time-continuous signal components and~~ the method further comprises modulating a selected one of the common synchronization code and the cell-specific synchronization code to the scattered pilot channel.

7. [Currently Amended] The method of claim 1, wherein each time-continuous signal component of the communication signal ~~comprises a plurality of sets of time-continuous signal components~~ is associated with a respective frequency indexes, and wherein the frequency indexes ~~of sets of time continuous signal components onto which~~ associated with the time-continuous signal components of the initial access channel ~~information is modulated~~ are separated by a power of 2.

8. [Cancelled]

9. [Currently Amended] The method of claim 6, ~~wherein the communication signal is an OFDM (Orthogonal Frequency Division Multiplexing) signal, and~~ wherein the scattered pilot channel is pair-wise scattered onto sub-carriers having a common sub-carrier index in pairs of consecutive OFDM symbols.

10. [Original] The method of claim 1, wherein the access channel information comprises a 3GPP (3rd Generation Partnership Project) PSC (Primary Synchronization Code), a 3GPP SSC (Secondary Synchronization Code) sequence, and a 3GPP primary scrambling code.

11. [Cancelled]

12. [Currently Amended] A method of accessing ~~a communication network~~ an Orthogonal Frequency Division Multiplexing (OFDM) communication network comprising a plurality of base stations, the method comprising:

receiving an OFDM communication signal ~~having a plurality of sets of time-continuous signal components~~;

searching the received signal for predetermined access channel information in ~~at least one predetermined set of the plurality of sets of time-continuous signal components~~ an initial access channel corresponding to a predetermined set of one or more time-continuous signal components of the OFDM communications signal, each time-continuous signal component being carried by a respective sub-carrier; and

determining synchronization parameters based on a location of the access channel information in the ~~at least one predetermined set of time-continuous signal components~~ initial access channel.;

wherein the access channel information comprises a common synchronization code that is common to each of the plurality of base stations and a cell-specific synchronization code that is orthogonal to the common synchronization code and unique to each base station.

13. [Cancelled]

14. [Currently Amended] The method of claim 13, wherein searching the received signal ~~for the common synchronization code~~ comprises:

sampling the received ~~communication~~ signal;

performing a time domain to frequency domain transformation using a transformation window starting at a start position to generate a frequency domain signal;

extracting frequency domain data corresponding to the ~~at least one predetermined set of time-continuous signal components~~predetermined set of one or more time-continuous signal components from the frequency domain signal within a window having a length of a predetermined period;

correlating the extracted data with the common synchronization code;

moving the predetermined period-length window by a predetermined step size until a starting position of the predetermined period-length window has been moved a distance of at least the predetermined period;

repeating the extracting and correlating for each position of the predetermined period-length window; and

determining peak correlation values indicating occurrences of the common synchronization code.

15. [Original] The method of claim 14, wherein the communication signal comprises a plurality of frames, each frame comprising a plurality of symbols, wherein the predetermined period is a length of each of the frames, and wherein the step size is a length of each of the symbols.

16. [Original] The method of claim 15, wherein determining synchronization parameters comprises determining candidate first symbols of the plurality of frames corresponding to the peak correlation values.

17. [Original] The method of claim 16, wherein the peak correlation values comprise a predetermined number of maximum correlation values.

18. [Original] The method of claim 16, wherein the peak correlation values comprise correlation values above a predetermined threshold.

19. [Original] The method of claim 16, further comprising:

generating a coarse timing position estimate,

wherein the transformation window start position is the initial timing position estimate.

20. [Original] The method of claim 19, wherein the communication signal further comprises a cyclic prefix, and wherein generating a coarse timing position estimate comprises estimating timing position based on the cyclic prefix.

21. [Original] The method of claim 15, further comprising:

moving the transformation window by a transformation window step size until a starting position of the transformation window has been moved a distance of at least the symbol length; and

for each position of the transformation window, repeating the performing, extracting, correlating, moving the predetermined period-length window, repeating the extracting and correlating, and determining peak correlation values.

22. [Original] The method of claim 21, wherein determining synchronization parameters comprises:

determining candidate first symbols of the plurality of frames corresponding to the peak correlation values; and

determining candidate coarse timing position estimates corresponding to respective transformation window start positions from which frequency domain signals associated with the peak correlation values were generated.

23. [Original] The method of claim 22, wherein the transformation window step size is one sample of the received communication signal.

24. [Original] The method of claim 22, wherein the transformation window step size is N samples of the received communication signal, N an integer, and wherein determining candidate coarse timing position estimates comprises searching transformation

window positions corresponding to the maximums of each correlation peak using a transformation window step size less than N.

25. [Original] The method of claim 24, wherein the communication signal further comprises a cyclic prefix, and wherein N corresponds a length of the cyclic prefix.

26. [Currently Amended] The method of claim 19, wherein searching the received signal further ~~for any of the plurality of cell-specific synchronization codes~~ comprises, for each of the candidate first symbols:

performing the time domain to frequency domain transformation using the coarse timing position estimate as the transformation start window position;

extracting frequency domain data corresponding to the ~~at least one predetermined set of time continuous signal components~~ predetermined set of one or more time-continuous signal components from the frequency domain signal;

correlating the extracted data with each of the cell-specific synchronization codes; and

determining peak correlation values indicating occurrences of one of the cell-specific synchronization codes.

27. [Original] The method of claim 26, further comprising:

identifying the base transceiver station associated with each of the cell-specific synchronization codes corresponding to the peak correlation values.

28. [Currently Amended] The method of claim 19, wherein searching ~~for the common synchronization code~~ the received signal further comprises storing the frequency domain signal to memory, and ~~wherein searching for any of the plurality of cell-specific synchronization codes comprises~~, for each of the candidate first symbols:

retrieving the frequency domain signal from the memory;

extracting frequency domain data corresponding to the ~~at least one~~ predetermined set of time-continuous signal components from the frequency domain signal;

correlating the extracted data with each of the cell-specific synchronization codes; and

determining peak correlation values indicating occurrences of one of the cell-specific synchronization codes.

29. [Currently Amended] The method of claim 22, wherein searching ~~for any of the plurality of cell specific synchronization codes~~ the received signal comprises, for each pair of one of the candidate first symbols and its corresponding coarse timing position estimate:

performing the time domain to frequency domain transformation using the coarse timing position estimate as the transformation start window position;

extracting frequency domain data corresponding to the ~~at least one~~ predetermined set of time-continuous signal components from the frequency domain signal;

correlating the extracted data with each of the cell-specific synchronization codes; and

determining peak correlation values indicating occurrences of one of the cell-specific synchronization codes.

30. [Original] The method of claim 29, further comprising:

identifying the base transceiver station associated with cell-specific synchronization codes corresponding to the peak correlation values.

31. [Cancelled]

32. [Cancelled]

33. [Original] A computer-readable medium storing instruction which, when executed by a processor, perform the method of claim 12.

34. [Currently Amended] A method of transmitting information in an unsynchronized Orthogonal Frequency Division Multiplexing (OFDM) communication network comprising a plurality of base transceiver stations, the method comprising:

modulating a cell-specific synchronization code uniquely associated with a selected one of ~~a~~ the plurality of base transceiver stations ~~in a communication network~~ onto a scattered pilot channel ~~carried by predetermined pilot channel sub-carriers~~ of an OFDM communication signal; ~~and~~

modulating access channel information to a predetermined initial access channel of the OFDM communications signal, wherein the access channel information comprises the cell-specific synchronization code and a common synchronization code that is orthogonal to the cell-specific synchronization code and common to each of the plurality of base transceiver stations, and wherein the initial access channel comprises a predetermined set of one or more time-continuous signal components of the OFDM communications signal, each time-continuous signal component being carried by a respective sub-carrier; and

transmitting the communication signal.

35. [Original] The method of claim 34, further comprising:

receiving the communication signal at a communication terminal;

extracting data from the scattered pilot channel;

searching for the cell-specific synchronization code in the data extracted from the scattered pilot channel; and

performing fine timing and frequency synchronization operations at the communication terminal when the cell-specific synchronization code is found in the data extracted from the scattered pilot channel.

36. [Cancelled] ~~The method of claim 34, wherein the communication signal further comprises a plurality of sets of time-continuous signal components carried by respective ones of a plurality of sub-carriers, and wherein modulating comprises modulating the common synchronization code and the cell-specific synchronization code onto at least one of the plurality of sets of time-continuous signal components.~~

37. [Currently Amended] The method of claim ~~36~~ 34, wherein the common synchronization code comprises a primary synchronization code (PSC) and a secondary synchronization code (SSC), and the cell-specific synchronization code comprises a scrambling code.

38. [Currently Amended] The method of claim 37, wherein the PSC, the SSC and a first portion of the scrambling code are mapped to ~~an~~ the initial access channel ~~comprising the at least one of the plurality of sets of time-continuous signal components~~, and a second portion of the scrambling code is mapped to the scattered pilot channel.

39. [Currently Amended] The method of claim 37, wherein the PSC is mapped to ~~an~~ the initial access channel ~~comprising the at least one of the plurality of sets of time-continuous signal components~~, and the SSC and the scrambling code are mapped onto the scattered pilot channel.

40. [Cancelled]

41. [Cancelled]

42. [Cancelled]

43. [Currently Amended] A base transceiver station in ~~a communication network~~ an unsynchronized Orthogonal Frequency Division Multiplexing (OFDM) communication network comprising a plurality of base transceiver stations, the base transceiver station comprising:

a processor configured to map ~~a synchronization channel to a set of time-continuous signal components in a communication signal~~ access channel information to a predetermined initial access channel of an OFDM communications signal, wherein the access channel information comprises a common synchronization code that is common to all of the base transceiver stations in the network and a cell-specific synchronization code that is orthogonal to the common

synchronization code and unique to the base transceiver station, and wherein the initial access channel comprises a predetermined set of one or more time-continuous signal components of the OFDM communications signal, each time-continuous signal component being carried by a respective sub-carrier; and

an output configured to transmit the communication signal.

44. [Currently Amended] The base transceiver station of claim 43, wherein the output is configured to be connected to ~~a plurality of antennas~~at least one antenna.

45. [Currently Amended] A communication terminal comprising:

an input configured to receive an OFDM communication signal ~~having a plurality of signal components carried by respective sub-carriers~~; and

a processor configured to search ~~for synchronization channel information in predetermined time-continuous sets of the signal components carried by respective ones of the plurality of sub-carriers~~ the received signal for predetermined access channel information in an initial access channel corresponding to a predetermined set of one or more time-continuous signal components of the OFDM communications signal, each time-continuous signal component being carried by a respective sub-carrier, and to determine synchronization parameters based on a location of the ~~synchronization~~ access channel information in the ~~predetermined time-continuous sets of the signal components~~ initial access channel.;

wherein the access channel information comprises a common synchronization code that is common to each of the plurality of base stations and a cell-specific synchronization code that is orthogonal to the common synchronization code and unique to each base station.

46. [Currently Amended] The communication terminal of claim 45, further comprising:

a memory for storing the synchronization channel information,

wherein the processor is further configured to retrieve the ~~synchronization~~ access channel information from the memory.

47. [Cancelled]